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THE CANNON COMPANY
A WORLD WAR II SOLUTION TO THE CLOSE
SUPPORT PROBLEM OF THE 1990's

A Monograph

by

Major John H. McDonald, Jr.

Field Artillery

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School of Advanced Military Studies
United States Army Command and General Staff College
Fort Leavenworth, Kansas

First Term AY 88-89

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REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1a. REPORT SECURITY CLASSIFICATION UNCLASSIFIED			1b. RESTRICTIVE MARKINGS		
2a. SECURITY CLASSIFICATION AUTHORITY			3. DISTRIBUTION / AVAILABILITY OF REPORT Approved for public release; distribution unlimited		
2b. DECLASSIFICATION / DOWNGRADING SCHEDULE					
4. PERFORMING ORGANIZATION REPORT NUMBER(S)			5. MONITORING ORGANIZATION REPORT NUMBER(S)		
6a. NAME OF PERFORMING ORGANIZATION School of Advanced Military Studies, USAC&GSC		6b. OFFICE SYMBOL (If applicable) ATZL-SWV	7a. NAME OF MONITORING ORGANIZATION		
6c. ADDRESS (City, State, and ZIP Code) Ft. Leavenworth, Kansas 66027-6900			7b. ADDRESS (City, State, and ZIP Code)		
8a. NAME OF FUNDING / SPONSORING ORGANIZATION		8b. OFFICE SYMBOL (If applicable)	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER		
8c. ADDRESS (City, State, and ZIP Code)			10. SOURCE OF FUNDING NUMBERS		
			PROGRAM ELEMENT NO.	PROJECT NO.	TASK NO.
11. TITLE (Include Security Classification) THE CANNON COMPANY: A World War II Solution to the Close Support Problem of the 1990's (U)					
12. PERSONAL AUTHOR(S) MAJ John H. McDonald Jr., USA					
13a. TYPE OF REPORT Monograph		13b. TIME COVERED FROM _____ TO _____		14. DATE OF REPORT (Year, Month, Day) 15 November 1988	
15. PAGE COUNT 38					
16. SUPPLEMENTARY NOTATION					
17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)		
FIELD	GROUP	SUB-GROUP	artillery brigade close support		
			direct support suppression		
19. ABSTRACT (Continue on reverse if necessary and identify by block number) Since WWI, the field artillery has been faced with a dilemma: the delivery of immediately responsive close support fires vs. the delivery of massed artillery fires to destroy or neutralize interdiction and counter-fire targets. The first requires maximum decentralization in organization for combat while the latter is best achieved through strong centralization of command and control of the available artillery assets. In recent years, a number of U.S. Army officers have called for a change in fire support organization and doctrine in order to achieve more responsive fire support. Yet many others continue to feel the current system provides the best balance between the two requirements placed upon the fire support system--fast vs. massed. The author of this study looks back to World War II to gain a perspective on how this dilemma was handled during that period. (Continued)					
20. DISTRIBUTION / AVAILABILITY OF ABSTRACT <input checked="" type="checkbox"/> UNCLASSIFIED/UNLIMITED <input type="checkbox"/> SAME AS RPT. <input type="checkbox"/> DTIC USERS			21. ABSTRACT SECURITY CLASSIFICATION UNCLASSIFIED		
22a. NAME OF RESPONSIBLE INDIVIDUAL MAJ John H. McDonald Jr.			22b. TELEPHONE (Include Area Code) (913) 684-2138		22c. OFFICE SYMBOL ATZL-SWV

After an examination of the development of the cannon company both in theory and in actual practice, the strengths and weaknesses of this concept are evaluated in the context of 1943-45.

The author surveys the changes in the dynamics of the battlefield that have occurred since the end of the Second World War, in order to judge how the fire support requirements have changed since 1945. He looks at changes in the armor, infantry, artillery, and aviation fields, and concludes that the need for immediately responsive close support fires is greater today than 50 years ago. The approaches of our main threat--the Soviets--as well as our major ally in NATO--the Germans--in solving the close support problem are examined for suitability for adoption by the U.S. Army.

The author concludes that the cannon company concept--a firing battery organic to the maneuver brigade--is a cost-effective solution to the problem of providing immediately responsive close support fires to the committed brigade while preserving the ability of the division commander to influence the battle through the flexible application of massed artillery fires.

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A World War II Solution to the Close Support Problem of the 1990's

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Unannounced	<input type="checkbox"/>
Justification	
By	
Distribution /	
Availability Codes	
Dist	Avail and/or Special
A-1	



School of Advanced Military Studies
Monograph Approval

Name of Student: Major John H. McDonald Jr.
Title of Monograph: The Cannon Company: A World War II Solution to
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Accepted this 16th day of December 1988.

ABSTRACT

THE CANNON COMPANY: A WORLD WAR II SOLUTION TO THE CLOSE SUPPORT PROBLEM OF THE 1990'S, by Major John H. McDonald Jr., USA, 34 pages.

Since World War I, the field artillery has been faced with a dilemma: the delivery of immediately responsive close support fires vs. the delivery of massed artillery fires to destroy or neutralize interdiction and counterfire targets. The first requires maximum decentralization in organization for combat while the latter is best achieved through strong centralization of command and control of the available artillery assets. In recent years, a number of U.S. Army officers have called for a change in fire support organization and doctrine in order to achieve more responsive fire support. Yet many others continue to feel the current system provides the best balance between the two requirements placed upon the fire support system--fast vs. massed.

The author of this study looks back to World War II to gain a perspective on how this dilemma was handled during that period. After an examination of the development of the cannon company both in theory and in actual practice, the strengths and weaknesses of this concept are evaluated in the context of 1943-45.

The author surveys the changes in the dynamics of the battlefield that have occurred since the end of the Second World War, in order to judge how the fire support requirements have changed since 1945. He looks at changes in the armor, infantry, artillery, and aviation fields, and concludes that the need for immediately responsive close support fires is greater today than 50 years ago. The approaches of our main threat--the Soviets--as well as our major ally in NATO--the Germans-- in solving the close support problem are examined for suitability for adoption by the U.S. Army.

The author concludes that the cannon company concept--a firing battery organic to the maneuver brigade--is a cost effective solution to the problem of providing immediately responsive close support fires to the committed brigade while preserving the ability of the division commander to influence the battle through the flexible application of massed artillery fires.

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INTRODUCTION

The mission of the field artillery is to destroy, neutralize, or suppress the enemy by cannon, rocket, and missile fire and to help integrate all fire support assets into combined arms operations.¹ In order to accomplish this mission, the field artillery system provides close support to maneuver forces, counterfire, and interdiction as required. With the publication of FM 100-5 Operations in 1982, much of the attention of the field artillery community has been focused upon the "deep battle", i.e., counterfire and interdiction. The Multiple Launch Rocket System (MLRS) and the Army Tactical Missile System (Army TACMS) are two of the more visible results of this focus. The third area, close support fires, has long been perceived as the primary mission of the field artillery.

In recent years, a number of journal articles and monographs have called into question the ability of the field artillery to satisfactorily provide adequate, responsive close support fires to the maneuver commanders. Several of these authors charge that as maneuver capabilities and doctrine have changed dramatically since the end of World War II, the field artillery has failed to adapt its tactics and organization to accommodate the changing requirements for effective close support fires. They argue for changes that would make the field artillery more responsive in providing close support fires to the brigade and battalion task force commanders. Conversely, other writers claim that these changes would reduce the ability of the

¹ Field Manual 6-20, Fire Support in the AirLand Battle (Final Draft) (Washington, D.C.: HQ, Department of the Army, April 1988), p. 2-8.

division commander to influence the battle through massed indirect fires.

In this paper we will examine the issue of close fire support to maneuver forces. We will define what is meant by close support fires, how the field artillery currently performs this role, and what specific criticisms have been raised by previous authors. We will look at the trade-offs involved in changing the current field artillery organizations and doctrine, and examine a solution used to solve the close support problem over forty years ago. The changes in both maneuver and fire support capabilities since World War II will be addressed with an eye towards evaluating the validity of this close support concept on the AirLand battlefield of the 1990's.

I. THE PROBLEM DEFINED

As stated in FM 6-20, Fire Support in the AirLand Battle, "the mission of the field artillery is to destroy, neutralize, or suppress the enemy by cannon, rocket, and missile fire and to help integrate all fire support assets into combined arms operations." This capstone manual for the fire support community lists three "roles", or types of fires, that the field artillery system has responsibility to provide: close support to maneuver commanders, counterfire, and interdiction. The field manual defines each "role" as follows:

Close Support Fires. These fires are used to engage enemy troops, weapons, or positions that are threatening or can threaten the force in either the attack or the defense. They allow the commander to rapidly multiply combat power effects and shift fires quickly around the battle. Close support expands battlefield depth, erodes enemy forces, and inflicts

damage well beyond direct-fire range.

Counterfires. Counterfires are used to attack enemy indirect-fire systems, to include mortar, artillery, air defense, missile, and rocket systems. Observation posts and field artillery command and control facilities are also counterfire targets. Counterfire allows freedom of action to supported maneuver forces and is provided by mortars, cannons, guns, and aircraft.

Interdiction Fires. These fires are used to disrupt, delay, and destroy enemy forces that, because of range limitations or intervening terrain, cannot fire their primary weapon systems on friendly forces. Targets include first-echelon forces not participating in the direct battle and follow-on echelons. Interdiction fires created "windows" for friendly unit offensive maneuver.²

These types of fires have different priorities for the field artillery system. While counterfire and interdiction need to be timely and accurate, they also need to be massive to insure the neutralization or destruction of enemy forces deep in the battle area. Close support fires need to be massive if the purpose is to destroy the targets, but the primary requirement for suppression is immediate responsiveness. The field artillery system must strike a proper balance between speed of responsiveness and weight of fires, or to put it another way-- "fast vs. massed."

While massing of artillery fires requires a high degree of centralization of command and control, speed of responsiveness is increased through decentralization. To serve these two masters, the U.S. Army has relied upon a process called "organization for combat" to establish command and control relationships. Under this two-step

² Ibid.

process, each field artillery unit is given a command relationship to a tactical unit (organic, assigned, attached, or operational control (OPCON)) and is assigned a tactical mission (direct support, reinforcing, general support reinforcing, or general support). The tactical mission determines a number of important responsibilities of the field artillery unit: who it answers calls for fire from and in what priority, who it is positioned by, what zone of fire it is responsible for, who plans its fires, and what requirements it has for providing fire support teams and liaison officers.³ The organization for combat is determined by the division commander, based upon the recommendation of the fire support coordinator (FSCoord), the division artillery commander. The five fundamentals considered in organizing for combat are:

- Adequate field artillery support to committed combat units.
- Weight to the main attack in offense or the most vulnerable area in defense.
- Facilitate future operations.
- Immediately available field artillery support for the commander to influence the action.
- Maximum feasible centralized control.⁴

At maneuver brigade level, this means that a field artillery battalion assigned to the division artillery will be placed in direct support (DS) of the brigade. The DS battalion answers calls for fire, in priority, from: the fire support teams (FISTs) attached to the brigade, its own radar, aerial observers, or survey parties, and from the

³ Ibid., p. 2-8 to 2-9.

⁴ Ibid., p. 2-10.

division artillery headquarters. Its zone of fire is the zone of action of the maneuver brigade and its fires are planned by the brigade FSCCOORD, the DS battalion commander. The DS FA battalion commander is also responsible for positioning the battalion, unless positioned by DIVARTY headquarters. Direct support is the most decentralized standard tactical mission, and hence, provides the most immediately responsive close support fires.

In recent years, a number of U.S. Army officers, both field artillery and from the maneuver arms, have called into question this system of allocating fire support. Emphasizing a need for more immediately responsive close support fires, several writers have argued that the DS artillery battalion should be organic to the maneuver brigade. In an Army War College study, Lieutenant Colonel Dale K. Brudvig, Armor, writes that the detailed coordination required for positioning field artillery units in the brigade rear area, the vast frontage that a division will be required to occupy, and the need for immediately responsive fires mean the FA battalion, along with all other combat support (CS) and combat service support (CSS) elements normally provided to the brigade from division assets, should be organic to the brigade.⁵ Major Thomas G. Waller, Jr., Field Artillery, argues in his School of Advanced Military Studies (SAMS) monograph that the field artillery has become increasingly focused on the deep battle--counterfire and interdiction--at the expense of immediately responsive close support fires.⁶ He cites increasingly centralized

⁵ LTC Dale K. Brudvig, "The Brigade With or Without Organic Combat Support and Combat Service Support", (Unpublished monograph, U.S. Army War College, 1976), *passim*.

⁶ MAJ Thomas G. Waller, Jr., "Continuous Thunder: The Challenge of

control of the artillery with the fielding of TACFIRE and a greater emphasis on destroying enemy targets through massed fires. "The idea that artillery employed en mass is most effective, while true, has diverted focus from supporting troops in contact to the attack of 'high-payoff' targets."⁷ But the generally poor performance of artillery battalions at the National Training Center (NTC) indicates "a lack of focus on the close support demands on field artillery."⁸ He concludes the current organization for combat is inadequate: "... even if the system is working perfectly, [the current system] has not proven itself capable of providing the type of responsiveness needed by the unit in contact."⁹ Major Robert W. Burkhardt, Engineer, addresses the question in his SAMS monograph, "Brigade Organization and the AirLand Battle." He states that a self-sufficient brigade, with all of its combat support and combat service support elements organic instead of in direct support, is better able to achieve the agility, initiative, depth and synchronization necessary to win on the modern battlefield. "This design corrects the AOE [Army of Excellence] design problems of poor agility, limited sustainability, complicated command and support links, reduced opportunities for initiative, combined arms training ineffectiveness, poor security in depth and overall confusion. In this example the factors influencing organizational design are consistent with one another."¹⁰ He notes that the Soviet regiment is

Artillery Support for the Close Battle". (Unpublished monograph, School of Advanced Military Studies, 1985), pp. 35-37.

⁷ Ibid., p. 29.

⁸ Ibid.

⁹ Ibid., p. 30.

¹⁰ MAJ Robert W. Burkhardt, "Brigade Organization and the AirLand Battle",

organized in peacetime as it will fight in war while the U.S. brigade is not. This hinders combined arms training and unit cohesion so necessary in war.¹¹

A number of field artillery officers have taken the opposite position. Major John J. Twohig, Field Artillery, concludes in his study, "Should the Current Direct Support Artillery Battalions of the Heavy Division be Organic to the Maneuver Brigade?" that the current system of organizing for combat is adequate. He correctly notes that "massing of fires is still a requirement on the battlefield."¹² Twohig points out that the division is the doctrinal tactical unit of maneuver, and as such, the division commander must have the ability to influence the battlefield through the massing of artillery fires.¹³ Major Michael D. Starry, Field Artillery, came to a similar conclusion in his monograph, "Close Support Artillery for the U.S. Light Infantry Division." While conceding that it may seem desirable to have some organic artillery in the maneuver brigade, he states, "The LID [light infantry division] is designed to combine arms at the division level and the division cannot synchronize firepower for the division battle if the artillery battalions are organic to the maneuver brigades. . . . The best relationship for now and into the 1990's remains the direct support mission which gives the division commander flexibility in employing scarce artillery assets as he synchronizes the division fight."¹⁴ Major Michael H.

(Unpublished monograph, School of Advanced Military Studies, 1985), p. 30.

¹¹ Ibid., p. 23.

¹² MAJ John J. Twohig, "Should the Current Direct Support Artillery Battalions of the Heavy Division be Organic to the Maneuver Brigade?", (Unpublished monograph, School of Advanced Military Studies, 1986), pp. 32-33.

¹³ Ibid., p. 33.

Vernon, Field Artillery, studied the organizing of field artillery for desert operations. This environment requires a maximum of decentralization due to the inherent speed and violence of desert warfare, and the increased frontages of units. While leaning very strongly to making the field artillery battalion organic to the maneuver brigade, Vernon concludes that the requirement to mass fires at division level makes this concept impractical. "Desert operations require that enough artillery assets be made available to provide responsive close support fires and be flexible enough to provide massed fires. Meeting both requirements necessitates that more artillery assets be provided to the division than is currently envisioned."¹⁵

The problem is clearly defined: the maneuver brigade commander desires more immediately responsive close support fires than the current field artillery doctrine provides while the field artillery community wants to retain the centralized control that allows the division commander to influence the battlefield through the flexible application of massed artillery fires. It is essential that our fire support system be capable of doing both tasks. In searching for a solution to this fire support dilemma, we shall take a look at a World War II innovation--the cannon company.

¹⁴ MAJ Michael D. Starry, "Close Support Artillery for the U.S. Light Infantry Division", (Unpublished monograph, School of Advanced Military Studies, 1986), Abstract.

¹⁵ MAJ Michael H. Vernon, "Organizing Field Artillery for Desert Operations: Tactical Tailoring of Field Artillery Units", (Unpublished monograph, School of advanced Military Studies, 1985), p. 32.

II. The Cannon Company, 1942-45

The cannon company was introduced into the infantry regiment Table of Organization (T/O) in March 1942 to solve a fire support problem encountered in World War I. During that conflict, the field artillery doctrine emphasized a very highly centralized command and control structure. This allowed the artillery commander to mass his fires to destroy enemy targets such as trenchlines and troop concentrations as well as accomplish counterfire and interdiction missions. Close support of maneuver units was an entirely different matter. The lack of reliable portable radio communications between the infantry and his supporting artillery meant effective close support fires were rarely achieved. The relative immobility of towed artillery weapons, especially in the morass that was the battle area along the Western Front, often resulted in the artillery's inability to keep pace with advancing infantry. In order to insure that the infantry regiment would have immediately responsive close support fires available, the force design planners at Army Ground Forces (AGF) headquarters introduced the cannon company into the regimental T/O.¹⁶

The cannon company of 1942 consisted of six 75-mm self-propelled howitzers and two 105-mm self-propelled howitzers, manned by 123 infantrymen. Only a handful of these units saw action in late 1942 and the reports on their effectiveness were inconclusive. LTG Leslie J. McNair, the Commanding General of AGF and a field

¹⁶ Kent Roberts Greenfield, Robert R. Palmer, and Bell I. Wiley, The Army Ground Forces: The Organization of Ground Combat Troops (Washington, D.C.: Office of the Chief of Military History, 1947), p. 302.

artilleryman, was unconvinced of the need for a cannon company in the infantry regiment. McNair and his staff reasoned that the regiment could be paired with a light artillery battalion from the division artillery when the tactical situation called for the formation of a combat team. They also doubted the value of self-propelled howitzers as opposed to the standard towed howitzers. Self-propelled howitzers took up more shipping space, consumed more fuel, were too heavy for many of the light bridges in the army inventory, and, surprisingly, were considered more vulnerable than their towed counterparts. Concerned with problems of strategic deployment and searching to eliminate unnecessary manpower requirements in the March 1942 T/O, General McNair abolished the cannon company. The new T/O listed three cannon platoons in the headquarters company of the infantry regiment, equipped with a total of six short-barrelled, towed 105-mm howitzers. AGF gained a reduction of 153 men per division through this change.¹⁷

This change did not sit well with the commanders in the field. Armed with a protest from LTG Dwight D. Eisenhower, the Commanding General of the European Theater of Operations, the War Department overruled the elimination of the cannon company. It was included in the Table of Organization published by AGF in July 1943, although shipping constraints resulted in the use of towed howitzers instead of planned self-propelled models.¹⁸ This last point is particularly important in evaluating the performance of the cannon company of World War II.

¹⁷ Ibid.

¹⁸ Ibid., pp. 314-17, 455.

The primary mission of the cannon company was to provide immediately responsive close support to the regiment, "particularly in fast-moving operations." The expected modus operandi was to first engage the target with the howitzers of the cannon company; if needed, the fires of the division artillery would then join the fight. In the direct fire role, the company was expected to be particularly effective in attacking bunkers, pillboxes, and other strongpoints. A major secondary mission of the cannon company was to provide anti-tank fire support to the regiment, although each regiment had an organic antitank company equipped with twelve 37-mm antitank guns. Additionally, the cannon company also had the capability to tie into the direct support field artillery battalion and lend the weight of its howitzers as a fourth firing battery.

In addition to the cannon company, the infantry regimental commander had several other weapons systems available to support him with direct and indirect fires. The previously mentioned antitank company was beefed up by the replacement of its ineffective 37-mm guns with newer 57-mm and later, 90-mm antitank guns. Each infantry battalion also had an antitank platoon, equipped with three 57-mm guns and a mortar platoon equipped with six 81-mm mortars.¹⁹ While LTG McNair had envisioned that tank and tank destroyer battalions would be attached to infantry divisions on a mission-essential basis, the practice developed of habitually attaching tank, tank destroyer, and 4.2 inch mortar units to the division on a regular basis.²⁰ Division commanders frequently attached these

¹⁹ Ibid., pp. 462-65.

²⁰ Russell F. Weigley, Eisenhower's Lieutenants: The Campaign of France

elements down to their regiments. Thus, the regimental commander had a significant amount of close support fires under his direct control.

The cannon company of 1943-45 failed to live up to the expectations of the force designers of 1942. The main problem was the substitution of towed low-velocity howitzers for the self-propelled versions as originally intended. This howitzer, the M3, had a shorter barrel than the regular 105-mm howitzer M2, possessed no ballistic shield, and had an effective range on only 7,250 yards as compared to 12,500 yards for the M2. It is not surprising to note the following evaluation of this poor substitute:

... Later reports from the theaters indicated that the cannon company in actual operations was used only occasionally in its intended role. The towed howitzers were not sufficiently maneuverable for close support of rapidly advancing rifle units. In many if not in most instances normal employment was by indirect fire; in such cases it was common practice to tie the cannon company in with the field artillery communications system and to use it as an additional battery of artillery. To a large extent direct-fire missions were performed by attached tank and/or tank destroyer units. . . . ²¹

Yet despite this rather gloomy evaluation, there were numerous examples of how effective the cannon company could be when properly equipped with self-propelled howitzers and when properly employed. In Sicily, the 16th Infantry Cannon Company played a key role in stopping a major German tank attack against the 1st Division landing beaches.²² Later, a platoon of the 15th Infantry Cannon

and Germany, 1944-1945 (Bloomington, IN: Indiana University Press, 1981), chapter 2, *passim*.

²¹ Greenfield et al., The Organization of Ground Combat Troops, p. 461.

²² Albert N. Garland and Howard McGraw Smyth, Sicily and the Surrender

Company ran a gauntlet of German tank fire in order to lend its fire support to the 3rd Battalion that had been halted by an enemy roadblock.²³ In the New Georgia campaign, the 25th Division made extensive use of its "infantry cannon" during the fighting around Munda.²⁴ During the Leyte campaign, the 1st Battalion, 17th Infantry provided a textbook example of the proper use of the cannon company to support its attack:

... Company B, reinforced by the platoon from the Cannon Company, moved out to destroy the enemy force on the regiment's left flank. The company fought the Japanese from pillbox to pillbox, catching the enemy on his flanks and rear by rifle and machine gun fire, together with time-burst fire from the self-propelled howitzers. This completely demoralized the Japanese, some of whom threw down their arms and tried unsuccessfully to escape. More than 120 enemy dead were counted in the area. The 1st Battalion entered the southern part of Dagami without encountering [further] serious resistance. . . .²⁵

Despite its alleged shortcomings, the field commanders resisted every effort by AGF to eliminate the cannon company from the infantry regiment. While each theater seemed to prefer different caliber weapons for the cannon company, they were nearly unanimous in favoring self-propelled over the towed howitzers. The Infantry School recommended that "the tank company be organized and equipped as a standard tank company (to be designated 'Tank

of Italy (Washington, D.C.: Office of the Chief of Military History, 1965), pp. 170-71.

²³ Ibid., pp. 195-96.

²⁴ John Miller, jr., CARTWHEEL: The Reduction of Rabaul (Washington, D.C.: Office of the Chief of Military History, 1959), p.162.

²⁵ M. Hamlin Cannon, Leyte: The Return to the Philippines (Washington, D.C.: Office of the Chief of Military History, 1954), p.143.

Company, Infantry Regiment'), with its principal weapon the 105-mm howitzer mounted on tank T26E2 (17 tanks in all--5 in each platoon and 2 in company headquarters)."²⁶ The School also envisioned the following mission:

Cannon Company. . . will take on the role of an assault company, and should in addition be capable of destroying enemy armor. It is intended that it should normally engage, by direct fire, targets which are too tough for battalion weapons, to include personnel, pill boxes and other targets of opportunity, fire on which is desirable before it can be obtained from the [divisional] artillery. (Emphasis added)²⁷

While both of these recommendations were approved by AGF, the proposals were disapproved by the War Department in April 1945.²⁸

The war ended before any further changes were made to the T/O of the cannon company, but the debate continued after V-E Day. The General Board, U.S. Forces European Theater, charged with the preparation of "a factual analysis of the strategy, tactics, and administration employed by the United States Forces in the European Theater", strongly urged the retention of the cannon company in the infantry regiment. The Board, noting that the "general mission of the cannon company is to provide close and continuous fire support to the infantry regiment", interviewed hundreds of senior combat commanders and concluded that, "Equipped with a towed weapon this company was unable to satisfactorily accomplish its mission." It noted that "while the mortar is an excellent weapon, it is not a satisfactory substitute for the supporting infantry cannon." "The majority of

²⁶ Greenfield et al., The Organization of Ground Combat Forces, p. 462.

²⁷ Ibid., p. 463.

²⁸ Ibid., p. 476.

combat leaders were of the opinion that the fire support of the 105-mm howitzer under the control of the regimental commander was essential but that it must be self-propelled to furnish him with a suitable accompanying gun."²⁹

All this proved in vain. During the severe budgetary and force structure cutbacks in the Army between World War II and the outbreak of the Korean War, the cannon company was dropped from the rolls of the infantry regiment.

III. CHANGES ON THE BATTLEFIELD, 1945-1988

The dynamics of the battlefield have changed dramatically since 1945. Technology has been the major catalyst for these changes, which are reflected in our doctrine and force structure. Too often armies fail to consider the impact of these changes until too late. They often find themselves fighting with obsolete equipment, organizations, and tactical doctrine. In order to avoid this pitfall, it is necessary to briefly survey the major changes in the dynamics of the battlefield since World War II, especially those that impact on the requirement to provide close support fires to the maneuver commander.

The most striking difference between the armies of World War II and the armies of the U.S. and the Soviet Union is the degree of mechanization of the combat and combat support forces. By the mid

²⁹ The General Board, U.S. Forces, European Theater, Organization, Equipment and Tactical Employment of the Infantry Division (Study Number 15) (London(?): HQ, U.S. Forces, European Theater, undated(approx 1946)), pp. 5-6.

1970's one out of every two U.S. infantrymen in the active component rode to battle in armored personnel carriers (APCs). The Soviet Army of the same period had 37 times as many APCs as the Red Army of 1945.³⁰ Over the last decade, both sides have improved the quality of their primary infantry vehicle: the American M2 Bradley infantry fighting vehicle (IFV) and the Soviet BMP. The mechanization of the infantry has caused two major changes in the battlefield dynamics: the obvious increase in mobility and the less obvious increase in protection from the effects of indirect fire. According to the 1976 edition of FM 100-5, Operations, it takes a dismounted infantry squad five hours to cover a distance of 30 kilometers; the same squad mounted in APCs can be there in less than two hours.³¹ During World War II, artillery fires accounted for more than half of the casualties sustained by all armies. Many of these were the result of "time on target (TOT)" massed surprise fires on unprepared and exposed infantry. While the infantry of today must dismount to fight once they close with the enemy, they will move more quickly and enjoy the ballistic protection of their IFVs during the period when previously they were most concentrated and vulnerable to indirect fire--during the approach to the line of contact. Thus, infantry targets must be engaged more quickly and the chances of their destruction by indirect fire alone are diminished.

A second major area of change on the battlefield has been the armored forces. The last forty years have seen major increases in the

³⁰ Field Manual 100-5, Operations (Washington, D.C.: HQ, Department of the Army, 1 July 1976), p. 2-10.

³¹ Ibid., p. 2-11.

firepower, protection, and mobility of the main battle tank. The M4 Sherman tank of World War II had to close to under 500 meters before its 76-mm main gun would penetrate the 4.8 inches of armor on the German PzV "Panther" tank. The 105-mm gun of the M60 tank of the 1970's could penetrate twice that much armor at four times the range, and the M1A1 Abrams tank of today has even greater penetrating capability in its 120-mm gun. Laser rangefinders, thermal imagery sights, and muzzle velocities twice as fast as 1945 combine to increase the probability of a first round hit at 1500 meters by ten-fold.³² The armor protection on modern tanks is roughly double that of World War II tanks. Recent developments such as reactive armor will increase tank survivability even more. Despite the massive increases in the size and weight of tanks since 1945, today's vehicles are more mobile and more agile:

While the modern[1976] U.S. main battle tank is one-third heavier than its World War II predecessor, it is equipped with an engine more than 2 times as powerful. Its agility has actually increased: its horsepower-to-ton ratio has increased by one fourth, its ground pressure has decreased by one-fourth, and its maximum cruising range has increased by three times.³³

The M1 Abrams is even faster and more agile than the M60 of 1976.

There are several significant fire support implications as a result of these advances in tank technology. The increased range and lethality of its firepower means enemy tanks must be screened or suppressed with indirect fire to reduce their effectiveness. The increased armor protection means that fewer tanks will be "killed" by indirect fire

³² Ibid., pp. 2-2 to 2-5.

³³ Ibid., p. 2-6.

(excluding "smart" munitions such as COPPERHEAD that will be available in limited quantities) than was the case in World War II. Additionally, the greatly increased armor protection of Soviet tanks has resulted in a change to the basic load of many U.S. armor units. Whereas the tanks of World War II carried a mix of antitank and high explosive ammunition to suppress infantry and destroy point targets such as bunkers and road blocks, U.S. tankers of the 1980's carry predominately armor piercing, discarding sabot (APDS or "sabot"). While highly effective against enemy tanks, this inert round has no explosive, suppressive effects against other targets. The increase in mobility, agility and cruising range of today's tanks means that less time will be available to mass fires on enemy tanks and greater range and mobility of friendly close support assets is needed to provide support to friendly tanks. The artillery's contribution to defeating enemy tanks is to strip away his accompanying infantry, force him to button up and obscure his ability to acquire targets. These missions require quick suppressive fires rather than massed destructive fires.

A third area of change since 1945 has been the emergence of long range antitank guided missiles (ATGMs) to defeat this greatly enhanced combat capability of the modern tank. The maximum effective range of the antitank cannon of World War II was approximately 1000 meters while the U.S. tube-launched, optically-tracked, wire-guided (TOW) missile is effective out to almost four times the range. The probability of a hit for U.S. and Soviet antitank crew served weapons has doubled in the last 20 years.³⁴ The effectiveness of the infantry weapons was demonstrated by the

³⁴ Ibid., pp. 2-7 to 2-8.

Egyptians in the 1973 Sinai War. Until the Israelis learned to use artillery and air to suppress these weapons, their armored forces were held at bay.³⁵

Close air support and aerial armed reconnaissance were instrumental in providing close support fires to the fast-moving armored columns of World War II. The P-47 Thunderbolt of 1944-45 could fly 100 miles to a target, loiter in the battle area for half an hour, deliver two 250-pound bombs and strafe with .50 caliber machine guns, and return to base. The A-10 Thunderbolt of today can fly from a base two-and-a-half times as far from the line of contact, loiter in at the front for four times as long, deliver thirty times more ordnance, and return home.³⁶ But in World War II, the ground commander found that CAS was readily available because of the large number of airframes available in theater and the fact that, by late-1944, the Luftwaffe was incapable of challenging the Allies for air superiority. This will not be the case today. With the A-10 scheduled to be replaced by a dual-mission variant of the F-16 Falcon, the ground commander can count on a minimum of CAS sorties being available to support his fight, at least until the Air Force has achieved some degree of air superiority.

Army aviation has grown dramatically in the post-World War II years because of the perception on the part of the Army leadership that Air Force close-support of ground operations would be significantly reduced from the levels of 1945. The fire support

³⁵ Waller, "Continuous Thunder", pp. 22-25.

³⁶ FM 100-5 (1976), p. 2-20.

capabilities of the AH-1S Cobra and the newer AH-64 Apache attack helicopters are quite impressive, but emerging doctrine from the Army aviation community indicates that the role envisioned for combat aviation brigades is not fire support of the ground commander involved in the close fight. Instead, these units will be employed as maneuver units to strike deep into the enemy rear to attrite and delay or disrupt the arrival of his follow-on echelon forces. While this is a valid and perhaps optimal use of these aviation units, the ground commander should not plan on receiving much fire support in the close battle from attack helicopters.

The field artillery has undergone significant changes since 1945. Both the U.S. and the Soviet Union have completed modernizing the artillery of their heavy divisions resulting in major improvements in mobility, range, and effectiveness of munitions. Virtually all artillery found in the heavy divisions is self-propelled. The range of the M109A3 155-mm howitzer is 18,100 meters compared to the 12,500 meters of the M2 105-mm howitzer of World War II. A battery of 155-mm direct support artillery firing one round delivers almost three times as much high explosive and covers over three times as much target area as the 105-mm DS artillery battalion of 1945.³⁷ Compared to the normal HE rounds of World War II, today's improved conventional munitions are four times as effective against personnel targets and lightly armored vehicles.³⁸ In essence, the self-propelled 155-mm artillery battery of today is far more mobile than its predecessor, engages targets at ranges sixty percent greater than the

³⁷ Ibid., p. 2-17.

³⁸ Ibid., p. 2-14.

M2, and can deliver the same weight of fire support as a towed battalion of 105-mm howitzers during World War II.

In summary, the changing dynamics of the modern battlefield have significantly altered the close support requirements since 1945.

Artillery fires must be more immediately responsive if they are to hit the more mobile targets on today's battlefield. The need for massing of fires is still present, and in fact greater, if the desired effect of indirect fire is destruction or neutralization, since the mechanized forces of today are better protected than those of World War II. But if the desired effect is suppression, then responsiveness is a more valued commodity than massiveness. This is certainly true in the suppression of ATGMs, air defense weapons, and in delivering smoke to screen friendly forces. The field artillery must be organized and equipped to provide fires for destruction, neutralization, and suppression. The traditional dilemma of immediately responsive close support fires as opposed to massed interdiction and counterfires is perhaps greater today than ever before.

IV. SOLVING THE CLOSE SUPPORT PROBLEM

As stated earlier, the focus of this paper is upon solving the close support problem. While we have defined "close support" in general terms, several questions need further clarification. How much fire support is needed? How fast is it needed? What type munitions effects are necessary? What are the other fire support needs of the command? While the answer to each of these questions is situationally dependent, we need to examine these requirements to

determine the best equipment, force structure and tactical doctrine to support the maneuver commander.

While a number of authors have discussed the need for better close support in general terms, General Crosbie E. Saint, former commander of III Corps and currently Commander-in-Chief, U.S. Army, Europe, has laid out some rather specific requirements for close support of the maneuver brigade. Writing in Field Artillery in June 1988, General Saint revived the World War II concept of "storm artillery." Citing the problem of keeping the divisional artillery within supporting distance of attacking forces, he envisions employing "lean artillery platoons and batteries comprised of tracked vehicles moving tactically within maneuver formations." This artillery must place its emphasis on immediate responsiveness rather than the weight of massed fires. "Proficiency with crew-served weapons and direct-fire skills take on added importance, and are a way of life." General Saint views the "storm artillery's" role in the attack in the following manner:

... When a mission is received, the cannons occupy emergency positions and provide fires 3000 to 4000 meters to the front and flanks, adjusting later. The idea is to suppress the enemy immediately and improve the survivability of the most maneuverable fire support arm while keeping all the cannons in the fight.³⁹

In an later interview with Field Artillery, General Saint issued the following challenge to the field artillery:

You need to figure out how you bring the artillery up with the attacking force so the battery is behind the lead task force. I need a high volume of fire within 15 seconds. As soon as somebody shoots at them, the artillery should stop

³⁹ LTG Crosbie E. Saint, COL Tommy R. Franks and MAJ Alan B. Moon, "Fire Support in Mobile Armored Warfare", Field Artillery (June 1988), pp. 12-14.

and dump about a battery six 2000 meters out front--then sort it out and adjust as they go.

I need responsive artillery that's very fast. . . .⁴⁰

Using General Saint's definition of close support fires, a number of solutions can be examined. When the results of the 1973 Sinai War were first evaluated, the Field Artillery School at Fort Sill began to take a serious look at the problem of providing fast, suppressive fires upon targets beyond the range of the maneuver commander's direct fire systems. The Fort Sill solution was a sort of part-time "storm artillery"--the dedicated battery. Major General David E. Ott, the commandant of the Field Artillery School, outlined the concept in the November-December 1974 issue of Field Artillery.⁴¹ Ott described the concept as an effort to "short circuit" normal fire direction and firing battery procedures, and noted it would "deviate from normal procedure in planning suppressive fires." Although he described the concept as a "simplified system", in reality it was not. The procedures differed radically from normal field artillery doctrine and units had to spend significant amounts of time practicing this concept. Additionally, the same battery was not always assigned the dedicated mission. While this spread the training value to all three firing batteries in the DS battalion, the close coordination and teamwork that comes from both the maneuver and fire support units habitually working with the same partner was lost.

Predictably, the dedicated battery was not universally embraced

⁴⁰ "The Key to Field Artillery: Focusing Combat Power". Interview with GEN Crosbie E. Saint, Field Artillery (October 1988), pp. 10-12.

⁴¹ MG David E. Ott, "Suppression", Field Artillery Journal, Vol. 42, No. 6 (November-December 1974), pp. 12-14.

within the field artillery community. Many "Redlegs" viewed it as a violation of the time-honored, fundamental concept of "maximum feasible centralized control" of artillery assets. This animosity exists even today. Major Steve G. Capps, in a 1988 letter to the editor of Field Artillery, criticized both the dedicated battery and the "storm artillery" concepts stating "... the FSCoord sacrifices centralized control for responsive fires."⁴² Capps suggests employing the 4.2 inch mortar for immediately responsive suppressive fire. Unfortunately, the mortar is ill-suited for this role. Its 5800 meter maximum range means the platoon must displace at least three times as often as an artillery battery to support the movement of the task force. This has proven to be a serious problem for battalion task forces at the National Training Center.⁴³ The high trajectory of the mortar projectiles results in a much longer time of flight, and a total lack of any direct fire or assault fire capability. The M106 mortar carrier in the firing mode offers no overhead cover for the crew and takes considerably longer to emplace than the new improved version of the 155-mm howitzer, the M109A3E2 HIP. While the mortar is capable of a high rate of fire, it lacks the wide variety of munitions available to the 155-mm howitzer. These limitations make the 4.2 inch mortar a

⁴² Ltr to the Editor from MAJ Steve G. Capps, Field Artillery (October 1988), pp. 2-3.

⁴³ This observation is based upon discussions with MAJ Sidney E. Riley. MAJ Riley was a Brigade Fire Support Officer in the 2nd Armored Division during 1985-1988. The point was reinforced during the author's visit to the NTC during 23-28 August 1988. In the course of a task force movement to contact and a night attack, the mortar platoon fired only one mission due to its inability to keep pace with the rapidly moving situation.

poor choice for the close support role on today's fast-moving battlefield.

The Soviets face exactly the same challenge in the close support arena. They also viewed the 1973 Sinai War with great interest. The Red Army had adopted "accompanying artillery" during the Second World War. Unlike the U.S. Army, they retained this artillery in the motorized rifle regiment throughout the post-war period. They also maintained a large artillery capability to perform the interdiction and counterfire missions at division and higher echelons. The 1973 Sinai War coincided with a resurgence of Soviet interest in "offensive maneuver combat." The Soviet response to the lessons of the Sinai differed markedly from the U.S. They increased the size of the motorized rifle regiment's "accompanying" artillery from a battery to a battalion, replaced the majority of their towed divisional artillery with newer self-propelled versions, and provided armored vehicles for artillery command and control. They still maintain a clear delineation in the roles of each level of artillery: the divisional artillery performs the equivalent of our interdiction and counterfire missions while the regimental artillery provides the close support fires.⁴⁴

The German Bundeswehr has adopted a similar solution. Building upon the World War II lessons of close support by self-propelled assault guns, the Germans have two separate artillery organizations to perform the two distinct types of artillery missions. The maneuver brigade commander's close support needs are met by his organic 155-mm SP battalion. The division commander's ability to influence the

⁴⁴ CPT John Gordon IV, "The Evolution of Soviet Fire Support, 1940-1988", Field Artillery (June 1988), pp. 18-21.

battle is provided by the 155-mm and 203-mm howitzers and the medium and light multiple rocket launchers found in the cannon and rocket battalions of the division artillery.⁴⁵

This appears to be the ideal solution. Each maneuver brigade has its own organic artillery battalion to provide close support while the division commander has an artillery regiment to mass fires on the battlefield. However, it is an expensive solution for the U.S. Army to adopt. If each heavy brigade were to receive an organic artillery battalion, thirty-three additional field artillery battalions would have to be added to the active divisions (including the round-out brigades). Indeed, the current U.S. approach, "organizing for combat", is an attempt to avoid these costs by having both types of artillery support--close support of the brigade and interdiction/counterfire--provided by the same artillery battalions. Providing each brigade its own organic battalion might be cost prohibitive, and based on General Saint's definition of the close support requirement, a case of "overkill." A better solution might be to provide the brigade commander with an organic artillery battery-- a cannon company--to meet this need.

V. THE CANNON COMPANY: A COST/BENEFIT ANALYSIS

The cannon company of 1988 would be configured essentially the same as a firing battery of a DS battalion. It would have eight M109A3E2 HIP howitzers, two fire direction centers (FDCs) with the Battery Computer System (BCS), an ammo section, and battery

⁴⁵ Author's interview with COL Quante, German Army Liaison Officer to the Command and General Staff College, 10 November 1988.

headquarters. Additionally, it would require a maintenance section that would be capable of performing unit-level communications, automotive and artillery maintenance. The company would be organic to the brigade, but could coordinate for training and technical assistance from the habitually associated DS artillery battalion. Fire planning for the cannon company's fires would be accomplished through the brigade FSCoord.

The cannon company of 1988 would differ from the cannon company of 1945 in several important aspects. First, as recommended by the General Board of 1945, all howitzers would be self-propelled. The HIP howitzer now coming into service is ideal with its on-board survey, communications, fire control and improved ballistic protection.⁴⁶ Second, the cannon company would be comprised of field artillery officers, NCOs, and enlisted men rather than the 123 infantrymen who manned the 1945 organization. The technical skills required of the infantryman and the artilleryman are too diverse to expect MOS 11B and MOS 13B to be interchangeable. Third, the new cannon company is not capable of effectively performing the antitank mission. Although a direct hit from a 155-mm artillery round will destroy most tanks and although the field artillery still trains to have the capability to destroy a tank by direct fire, the slow rate of fire and low probability of hit make a howitzer a poor tank-killing system.

The cannon company will provide the brigade commander with several enhanced capabilities. It provides immediately responsive indirect fire support at three times the range of the 4.2 inch mortars

⁴⁶ CPT Robert I. Zabielski, "The HIP Connection", Field Artillery (October 1988), 35-39.

found in each maneuver battalion task force. The 155-mm family of munitions offers a much greater variety and lethality of terminal effects than the 4.2 inch mortar. The ballistic protection of the HIP howitzer far exceeds that of the M106 mortar, and the faster emplacement times of the new howitzer will mean rounds on the target much faster than the mortar platoon can provide.

The cannon company provides the maneuver commander with a direct-fire area suppression and a point-target destruction capability that is now lacking in the brigade. While the howitzer is not a promising weapon for destroying tanks at close range, it is highly effective against bunkers, pillboxes, roadblocks, and other fixed point targets. This allows the maneuver commander to utilize his tank ammunition and his ATGMs against armored vehicles. Assault fire against dismounted infantry or other exposed personnel allows the commander to engage these targets at ranges greater than those of his organic small arms. It also provides a capability against assault helicopters landing troops or attack helicopters in hide positions.

The cannon company would provide the organic "storm artillery" support for the brigade in offensive operations. Since this would be a priority mission for the unit and since the same unit would always be providing this support, it should provide a more efficient and effective alternative to the dedicated battery. The cannon company would provide the initial suppressive fire on targets of opportunity and, if necessary, the DS artillery battalion could later join in firing on the target to achieve neutralization or destruction. The enhanced capabilities of the HIP howitzer in both the cannon company and the

DS battalion eliminates many of the technical problems involved in massing these fires, such as common survey and communications. While the HIP howitzer does not have the same degree of mobility as the M1 tank or the M2/3 fighting vehicles, its 18 kilometer range and improved ballistic protection should allow it to provide effective close support of these fast-moving maneuver forces.

When the brigade is not committed, its organic cannon company can be assigned one of the traditional support missions, although the brigade commander would still have "strings" on positioning authority and consumption of ammunition to insure that the cannon company is properly postured to support the brigade in any on-order mission. The German army uses this same procedure with the organic artillery battalions of its uncommitted maneuver brigades.⁴⁷ The cannon company has the necessary communications and fire control capabilities to assume this mission without any augmentation. Another possible mission for this company would be as the primary fire support element for rear battle. In all likelihood, one of the battalions of the uncommitted brigade would be responsible for rear operations, and the cannon company could provide immediately responsive close support to this task force.

The costs for adopting the cannon company concept can be measured in several ways. Approximately 130 officer and enlisted personnel would be assigned to each of the thirty-three cannon companies that would be in the heavy divisions.⁴⁸ These 4290 slots

⁴⁷Interview with COL Quante.

⁴⁸ According to Field Manual 101-10-1/1, Staff Officers' Field Manual: Organizational Technical and Logistical Data (Volume 1), dtd October 1987, the firing battery of the DS artillery battalion of a heavy division is authorized 115

would have to be taken from other units and agencies in order to remain within the congressionally mandated ceiling. The equipment costs to outfit the cannon companies must also be considered. The argument could be made that 11 more field artillery battalions should be fielded instead of 33 separate cannon companies, although this would entail a significantly greater overhead due to the headquarters and service batteries. Finally, the financial and personnel resources to man these cannon companies could be utilized in other types of units, such as the divisional cavalry squadron or even a brigade cavalry troop.

These costs must be evaluated with several thoughts in mind. A number of maneuver commanders have indicated that they consider the current close support fire arrangements as unsatisfactory. The DS battalions are not responsive enough and these commanders would like to make the artillery battalions organic to the brigade. This cannot be done without sacrificing the division commander's ability to mass fires. Eleven more artillery battalions will not solve this problem. As far as diverting these resources to needs other than the artillery, it is interesting to note that in the past 12 years, the U.S. division saw an increase of 9 percent in the number of its tubes while the Soviet division increased by 133 percent. In the scenario where a U.S. heavy division, reinforced with its usual corps artillery brigade, is defending against a Soviet combined arms army as the front main effort, the U.S. force is at a 7.8 to 1 disadvantage in tube artillery and a 3.5 to 1 in multiple rocket launchers.⁴⁹ The addition of 24 tubes

officers and men. The addition of a maintenance section for communications and automotive support should total approximately 130 personnel.

dedicated to the close support role will be heartily welcomed by the maneuver brigade and task force commanders.

CONCLUSION

The field artillery community needs to continually evaluate the fire support organization and doctrine to insure that the best possible use of scarce resources is made in accomplishing its mission. The battlefield of the 1990's will place high demands on the fire support system. The maneuver brigade commander must be provided the most immediately responsive close support fires possible while insuring that the division commander retains the ability to influence the battle through the flexible maneuver of massed artillery fires. In the 1940's, force designers solved this problem by adding a cannon company to the infantry regiment's table of organization. Improperly trained and equipped, the cannon company performed well enough for field commanders to resist every effort of the War Department to abolish the organization. The cannon company of the 1990's, properly trained and equipped, can provide that responsive close support while the divisional artillery battalions can augment the fires of the cannon company or mass fires in the destruction or neutralization of other targets in the division area of interest. In this cost-effective manner, the dilemma of the field artillery--fast vs massed--can be eliminated.

⁴⁹ Gordon, "The Evolution of Soviet Fire Support", p. 21.

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